<u>REMARKS</u>

The present application was filed on July 30, 2001 with claims 1-38. In the outstanding final Office Action, the Examiner: (i) rejected claims 1, 9, 10, 15, 19, 27, 28, 33, 37 and 38 under 35 U.S.C. §103(a) as being unpatentable over B. Kitts et al., "Cross-Sell: A Fast Promotion-Tunable Customer-Item Recommendation Method Based on Conditionally Independent Probabilities" (hereinafter "Kitts"); (ii) allowed claims 2-8, 16-18, 20-26 and 34-36; and (iii) acknowledged allowable subject matter in claims 11-14 and 29-32.

Applicants appreciate the allowance of claims 2-8, 16-18, 20-26 and 34-36. Applicants have canceled claims 10 and 28 and rewritten claims 11 and 29 in independent form incorporating all limitations of respective base claims. Claim 15 now depends from claim 11, and claim 33 now depends from claim 29. Accordingly, Applicants assert that claims 2-8, 11-15, 16-18, 20-26 and 29-36 are now in condition for allowance.

Regarding the §103(a) rejection of independent claims 1, 9, 19, 27, 37 and 38, although Applicants believed that said claims as originally filed were patentable over Kitts, Applicants nonetheless amended said claims, in a previous response dated January 16, 2004, to further clarify the claimed invention in a sincere effort to move the case through to issuance. In general, Applicants amended such claims to indicate that the patterns being identified are <u>mutual dependence</u> patterns.

Applicants then explained in the previous response that Kitt discloses a "conditional independence." From page 438, section 3, of Kitts, it is clear that such conditional independence is a <u>one way</u> (pair-wise) relationship, i.e., Kitt looks only at the probability of b given a, c, d, e, ... or n. However, as expressly stated at the top of the right hand column of page 438 of Kitts: "[t]he disadvantage of this constraint is that accuracy can be lower because we are ignoring interactions."

Applicants then further explained in the previous response that, on the other hand, the claimed invention is directed toward <u>mutual dependence</u> and thus is able to consider interactions, e.g., more than just a one way relationship. As illustratively explained in the present specification, at page 7, line 22, through page 8, line 5:

Intuitively, an <u>m-pattern [mutual dependence pattern]</u> captures a set of items that often occur together. In other words, if a part of an m-pattern occurs, it is likely, to a high

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probability, that the other part of the m-pattern will be seen. This can be formally defined as follow:

A set of items $E = \{i_1, i_2, ..., i_k\}$ is said to be an m-pattern with a minimum mutual dependence threshold *minp*, if and, preferably, only if the conditional probability $p(E1|E2)$ is above a minimum mutual dependence threshold *minp*, where 0 *minp* 1, for any non-empty two subsets $E1$ and $E2$ of E.

The conditional probability can be estimated by $p(E1|E2) = count(E1+E2)/count(E2)$, where $p(x)$ is the occurrence probability of x, and $count(x)$ represents the number of occurrences of x in the data.

Thus, as Applicants' previous response concluded, Kitts is completely silent to mutual dependence patterns and a mutual dependence threshold value. This is why Kitts is called a "recommendation method based on conditionally independent probabilities" (see title of Kitts).

The final Office Action, in the section labeled "Remarks" at pages 2 and 3, disagrees with the above assertions. Based on the rationale in the final Office Action, Applicants respectfully believe that the express language in claims 1, 9, 19, 27, 37 and 38 is not being fully understood by the Examiner. Applicants thus offer the following remarks in a further effort to assist in an understanding of the express language of the subject claims.

Claim 1 recites "identifying sets of items in the input data set as mutual dependence patterns based on respective comparisons of conditional probability values associated with each of the sets of items to a predetermined mutual dependence threshold value." The final Office Action states that the claimed invention "does not allow more [than] just a one way relationship." The Examiner's rationale is based on the specification text cited in Applicants' previous response (page 7, line 22, through page 8, line 5). However, Applicants point out that the specification text was cited to give an example of a comparison that may be performed to determine mutual dependence patterns.

However, as the claim recites "sets of items in the input data set" are identified "as mutual dependence patterns based on respective comparisons of conditional probability values associated with each of the sets of items to a predetermined mutual dependence threshold value."

That is, it should be understood that, as further illustratively described at pages 8-10 of the present specification, comparisons are made between conditional probability values associated with each of the sets of items and a predetermined mutual dependence threshold value. For instance, the

specification illustratively explains that "the definition of m-patterns [mutual patterns] requires to compute the conditional probability of any two subsets of a pattern, and test it against minp [mutual dependence threshold value] . . . . [c]learly, this requires to compute $O(2^k)$ conditional probabilities, and comparisons, where k is the length of a pattern." While the invention provides efficiencies, this text is cited to illustrate the idea of the comparisons associated with identifying mutual dependence relationships. Also, the idea of comparisons is further to be understood by use of the term "mutual," which may be illustratively defined as "directed by each toward the other or others" (see, for example, "Webster's Ninth New Collegiate Dictionary," Merriam-Webster Inc., 1991).

Thus, Applicants again assert that since the claimed invention is directed toward mutual dependence, it is able to consider interactions, e.g., more than just a one way relationship. Kitts, however, is clearly directed toward a one way (pair-wise) relationship and not toward mutual dependence relationships.

Further, as is clear from the disclosure of Kitts and first asserted in Applicants' previous response, Kitts is concerned only with customer recommendations and not with pattern discovery. This is why Kitts does not disclose "outputting the identified mutual dependence patterns based on results of the comparisons," as in the claimed invention.

The final Office Action acknowledges that Kitts does not disclose this limitation, however, the final Office Action suggests that it would be obvious to modify Kitts to do so. Applicants again strongly disagree.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." In re Lee, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Moreover, the Federal Circuit has stated that "conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority." Id. at 1343-1344.

In the final Office Action at page 5, the Examiner provides the following restatement to prove motivation to modify Kitts, with emphasis supplied: "[o]ne would have found it motivated to . .

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[modify Kitts to] provide . . . <u>the enhanced capability of maximizing profit minus the profit you would expect to receive due to the natural course of customer's purchasing.</u>"

Applicants submit that this restatement is also based on the type of "subjective belief and unknown authority" that the Federal Circuit has indicated provides insufficient support for an obviousness rejection. More specifically, the Examiner fails to identify any objective evidence of record which supports the proposed combination. Again, it is not completely clear what this statement actually means in the context of the disclosure of Kitts and the claimed invention.

In view of the above, Applicants believe that claims 1-38 are in condition for allowance, and respectfully request withdrawal of the §103(a) rejection.

Respectfully submitted,

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